



## **1. COMMISSIONING DEFINITION**

Building commissioning performed in new construction and existing buildings helps to ensure that systems and their interconnections are installed, functionally tested, and capable of being operated and maintained to perform in conformity with the design intent and the owner's needs. The process is commonly defined as one of testing system performance and correcting identified problems to ensure that a new building begins its life cycle at optimal productivity. Commissioning can also restore an existing building to optimal operation. Further, when commissioning is repeated periodically throughout the life of a building, it improves the likelihood that the building will maintain a high level of performance and operational sustainability

## **2. COMMISSIONING BENEFITS**

The commissioning process involves functional performance testing and other diagnostic methods, documenting the results of testing as well as any resulting fixes, and reporting these results to the City. These activities help determine how well the building systems are performing individually and as an integrated whole. A thorough commissioning process will confirm that building systems and equipment are operating properly, allowing the City to realize the benefits of:

- Improved building system control;
- Increased energy efficiency;
- Improved building equipment performance;
- Improved indoor air quality, occupant comfort, and productivity;
- Decreased potential for owner liability; and
- Reduced operation and maintenance costs

## **3. COMMISSIONING PROTOCOL**

### **A. Pre-design/Project Planning Phase**

Every City project shall include at a minimum, commissioning of the building HVAC systems and commissioning of lighting controls that include daylight or occupancy sensing automatic controls, automatic shut-off controls, or automatic time switches as required by the Seattle Amendments to the Washington State Energy Code. When the complexity of the project warrants, the City may decide that an independent Commissioning Consultant be used for the Project. When Independent Commissioning is required the project budget will be structured to accommodate the following procedures and those out outlined in Appendix 1-I. – International Performance Management & Verification Protocol.

### **B. Project Design Phase**

The Project Manager will include in the A & E contract Scope of Work, specific requirements to include Commissioning tasks beginning as early as possible in the project design phase and in Construction Documents to be bid and performance defined commissioning services at construction completion. The plan will utilize and incorporate City Maintenance and Building Management staffs in final inspection and operations training efforts. If an independent Commissioning Consultant is to be used, the A&E Scope will acknowledge usage, and provide services to appropriately interface with that consultant during all phases of design and construction.

The decision to use an Independent Commissioning Consultant shall be made as early in project development as possible, preferably before project design work begins in order to gain the full benefit of the Commissioning Consultant's services during the design phase. If a Commissioning



Consultant is utilized, the Project Manager will arrange for selection and establishment of a contract with an appropriate firm to perform those services. That Consultant shall participate in the development of project plans, review plans, and review, comment upon, and recommend language for Construction Bid Documents structuring Construction Contractor services and requirements for Commissioning.

#### **C. Construction Bid**

A&E will include requirements of the Contractor in the bid documents that provide commissioning activities and tasks, including;

1. Procedures for final inspections of the Work, which include inspections by City Maintenance and Building Management staffs
2. Full set-up, balancing, demonstration, and testing of operation for all building systems, Electrical, Mechanical, Fire Protection, Electronic, and Doors and Hardware components. If an independent Commissioning Consultant is utilized, specific interaction requirements with that Consultant shall be specified.
3. Provision to the City (for conveyance to Maintenance and Building Management staffs) of complete as-built record drawings (in electronic form) and Operation and Maintenance Manuals and Instructions.
4. Provision for City Maintenance and Building Management staffs of complete operational training on building systems.

#### **D. Construction Phase**

Early in the construction activity, the Project manager and A&E will meet with representatives of the Maintenance and Building Management staffs, to discuss the intended design features of major components, their intended operation, and specific concerns for inspection and verification by the City staff. The group will establish a specific plan and procedure of intended inspection points during construction.

During construction, City Maintenance and Building Management staffs will provide periodic inspections of building components and systems, at appropriate points to be able to note deficiencies before components are covered within the construction.

At nominal completion of construction, City staff will perform a comprehensive inspection of all building systems and components, noting apparent deficiencies to the A&E for inclusion in the Contractor's completion punchlist.

#### **E. Commissioning Phase**

A pre-planned and established specific protocol for commissioning activities shall be prepared and agreed to by all parties prior to completion of construction. The plan shall include the specific description of tasks, sequencing and schedule of those tasks, and specification of individuals and agencies involved in each task.

If an independent Commissioning Consultant is utilized, that consultant shall have primary responsibility for preparation of the plan. If such a consultant is not involved, the Project manager shall have primary responsibility, with consultation of the A&E and the City Maintenance and Building Management staffs.



The plan shall include at minimum:

1. Equipment and systems to be tested, including the extent of sampling tests.
2. Functions to be tested (for example calibration, economizer control, etc.).
3. Conditions under which the test shall be performed (for example, winter design conditions, full outside air, etc.).
4. Measurable criteria for acceptable performance.
5. Inspection, verification, and documentation of initial system components start-up
6. Verification and documentation of system testing, balancing, and establishment of initial operational settings. The functional testing objectively verifies and documents that the building systems perform interactively in accordance with Project Documents and design intent.
7. Scheduling, orchestrating, and documentation of full demonstration and training of City Maintenance and Building Management staff.
8. Verification of City receipt, and appropriate distribution, of project as-built record documents and Operations and Maintenance Manuals.
9. Establishment of warranty item response procedures and appropriate contacts
10. Establishment and initiation of ongoing building operation procedures and maintenance schedules.
11. Installation of non-contact equipment and materials (furniture, phone/data, tenant equipment, etc.)
12. Tenant move-in schedule and procedures, if appropriate.

During the Commissioning Phase activity, regular weekly meetings of the Project Manager, Tenant representatives, Maintenance and Building Management staff, and Commissioning Consultant (if one utilized) shall occur to verify plan progress and resolve issues.

#### **F. Commissioning Reports**

Preliminary and final commissioning reports shall be prepared regardless of whether an independent commissioning consultant is utilized.

The preliminary commissioning report shall identify the following:

1. Deficiencies found during testing that have not been corrected at the time of report preparation and the anticipated dated of correction.
2. Deferred tests that cannot be performed at the time of report due to climatic conditions.
3. Climatic conditions required for performance of the deferred tests, and the anticipated date of each deferred test.

The **final commissioning report** shall provide a complete report of test procedures and results.

**It is important to note that successful commissioning is a prerequisite to obtaining credit for Energy and Atmosphere under the LEED® Rating System.**

#### **G. Small Project Commissioning**

It is intended that small projects incorporate the same Commissioning function as noted in the larger Projects' process noted above. However, the effort involved will be planned and led by the Owner's Project Manager. Effort, as described below, will still occur at all phases of the Work:

1. Project Planning will include specific decisions about which City staff will participate in Commissioning planning and activities. Property Management staff shall be part of the project planning team, reviewing and commenting on all aspects of the project plan.



Maintenance and Janitorial sections will be informed about the existence and scope of the planned project, and provided the opportunity for comment before project scope is finalized.

2. Project Design activities, whether done by A&E consultants or performed in-house, will include planning for Commissioning. Specifically, any activities to be required of a construction contractor, will be fully detailed and required in the specifications. City Maintenance, Janitorial and Property Management sections will be provided the opportunity for a full review of all design documents prior to final approval and bidding.
3. During Project Construction, the Owner's Project Manager shall prepare a final detailed Commissioning Plan, which shall be reviewed and agreed to by affected section staff from Maintenance, Janitorial, and Property Management, as well as by any Tenant representatives, the A&E, and Construction Contractor. The plan shall incorporate all the elements noted in section E. above. It shall specifically detail individuals, and their task assignments and schedules. Should independent balancing or system adjustment be required at construction completion, the Owner's Project Manager shall make appropriate contractual arrangements to insure availability and scheduling of those services.

Also during Construction, City Maintenance and building operations staff shall perform periodic inspections of the Work, noting any observed deficiencies to the Owner's Project Manager. They shall be present and observing of any initial system start-up.

Upon Substantial Completion of Construction, the City Maintenance and Property Management staffs shall inspect the building, noting any observed deficiencies to the Owner's Project Manager. Such listed deficiencies shall be corrected or reconciled prior to establishing of construction Physical Completion.

4. The project Commissioning Phase shall begin upon establishment of project construction Substantial Completion, and shall entail the implementation of the adopted Project Commissioning Plan noted above. Should design have been done in-house, or construction been done by City forces, the A&E's tasks and Contractor's tasks must be assigned, scheduled and accomplished by those in-house forces, in the same manner, and to the same extent as if they had been contracted for.

**End of Appendix 1 - H**